Examining the Fed and Rising Interest Rates
INV 330
Presenters

• Jason Headings
• Meeder Investment Management
• (614) 760-2111
• jheadings@meederinvestment.com
Agenda

• History of the Fed
• Fed Mandates
• Current Complexion of the Fed
• What’s Next?
History of the Fed
HISTORY OF THE FED

- No central bank (Federal Reserve) in America
- Knickerbocker Trust loaning out 99% of its reserves
- Run on Banks
- Banks did not have enough cash on reserves
- JP Morgan bailed out the banking system
HISTORY OF THE FED

• 6 influential banking leaders get together on Jekyll Island, GA

• First U.S. Central Bank (Federal Reserve) was created

• Bank had a bad name, so they called it the Federal Reserve to make it sound official

• All banks have to play by the same rules...every bank has to keep the same percentage of deposits on hand

Operated the same until 2008
HISTORY OF THE FED

• Financial Services Regulatory Relief Act goes into effect

  Congress allows the Fed to pay interest on required reserves AND excess reserves

• Roughly $1.6 billion in excess reserves.

• Roughly $68 billion in required reserves.
QUANTITATIVE EASING BEGINS
FED BALANCE SHEET

Source: Board of Governors of the Federal Reserve System (US)
EXCESS RESERVES OF DEPOSITORY INSTITUTIONS

Source: Board of Governors of the Federal Reserve System (US)
Fed Mandates
MANDATE OF THE FED

- Price Stability/Inflation
- Employment
- Rate Stabilization/Manage Bubbles
Inflation
INFLATION

Headline PCE: 1.90%
Core PCE: 1.74%
Fed Target: 2.00%

Source: Bloomberg
INFLATION
10 Year Treasury Yield

Source: Bloomberg
# TRADE IMPORTS

What Does the U.S. Import From the Rest of the World?

<table>
<thead>
<tr>
<th>Exporter</th>
<th>Most important US imports</th>
<th>Second most important imports</th>
<th>Third most important imports</th>
<th>Fourth most important imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>Car parts</td>
<td>Trucks and buses</td>
<td>Cars</td>
<td>Computers</td>
</tr>
<tr>
<td>Germany</td>
<td>Cars</td>
<td>Pharma</td>
<td>Airplanes</td>
<td>Car parts</td>
</tr>
<tr>
<td>Japan</td>
<td>Cars</td>
<td>Car parts</td>
<td>Machines</td>
<td>Airplanes</td>
</tr>
<tr>
<td>Korea</td>
<td>Cars</td>
<td>Cell phones</td>
<td>Car parts</td>
<td>Petroleum</td>
</tr>
<tr>
<td>Canada</td>
<td>Oil</td>
<td>Cars</td>
<td>Re-imports</td>
<td>Car parts</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Pharma</td>
<td>Cars</td>
<td>Re-imports</td>
<td>Airplanes</td>
</tr>
<tr>
<td>China</td>
<td>Cell phones</td>
<td>Apparel</td>
<td>Computers</td>
<td>Computer access.</td>
</tr>
</tbody>
</table>

Source: Census Bureau 2015, DB Global Markets Research

You cannot invest directly in an index.
INFLATION OUTLOOK

U.S. 5-Year Breakeven Index

Source: Bloomberg
Unemployment
Since the Great Recession the quarterly unemployment rate has fallen by half – from a peak 9.9% to a low of 4.70% - while the federal funds has remained low by historical standards.
FED MANDATE: UNEMPLOYMENT

Labor force participation rate decline since 2007 peak
Population employed or looking for work as a % of total, ages 16+

Source: Bureau of Labor Statistics
UNEMPLOYMENT BY EDUCATION LEVEL
Ages 25 and Greater

Education Level         Jan. 2017
Less than high school degree  7.9%
High school no college       5.0%
Some college                  4.0%
Bachelor’s degree and higher  2.4%

Source: Bureau of Labor Statistics
Student Loans
STUDENT LOAN DEBT
Outstanding student loan debt

The current student debt amount is rising at a rate of $2,667 per second. This number is estimated by calculating the per second change in student debt from Q1 2006 to Q4 2016 using debt data from the Federal Reserve.

Source: Federal Reserve Center for Microeconomic data as of March 2017
STUDENT DEBT FACTS

- 66% of graduates from public colleges had on average $25,550 debt
- 75% of graduates from non-profit colleges had on average $32,300 debt
- 88% of graduates from for-profit colleges had on average $39,950 debt
- Estimated 82% students used their student loan money for vacation, parties, electronics, and similar
- Over 2% of the US population = 7+ million defaulted on student loans
- Total Increase In Student Loan Debt In 4Q-2016: $31 billion
- New Delinquent Balances (30+ days): $32.6 billion

Source: https://debtclock.tv/world/us/student-loan/
STUDENT DEBT FACTS

Failing to Repay

Some 43% of the roughly 22 million Americans with federal student loans were either behind or received permission to postpone payments due to economic hardship as of Jan. 1.

**Americans who are out of school and owe federal student loans**

- **3.6 MILLION**
  - In default*
- **3.0**
  - Delinquent†
- **3.0**
  - In postponement
- **12.5**
  - Current on their loans

**Debt outstanding by type of consumer loan**

- $1.2 trillion
- 2003 '05 '10 '15

*At least 360 days behind on a payment  †Between 31 days and 360 days behind on a payment

Sources: Education Department (student loans); Federal Reserve Bank of New York (debt outstanding)

THE WALL STREET JOURNAL
STUDENT LOAN DELINQUENCY
Student Loans 90+ Days Delinquent as Percent Loans Outstanding

Source: Federal Reserve Center for Microeconomic data as of March 2017
CONSUMER CREDIT DELINQUENCY
Percent Of Balance 90+ Days Delinquent By Loan Type

Source: Federal Reserve Center for Microeconomic data as of March 2017
## STUDENT DEBT STATISTICS
Average student loan debt by state

### HIGH-DEBT STATES

<table>
<thead>
<tr>
<th>State</th>
<th>Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Hampshire</td>
<td>$36,101</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>$34,798</td>
</tr>
<tr>
<td>Connecticut</td>
<td>$34,773</td>
</tr>
<tr>
<td>Delaware</td>
<td>$33,849</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>$32,920</td>
</tr>
<tr>
<td>Minnesota</td>
<td>$31,526</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>$31,466</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>$31,452</td>
</tr>
<tr>
<td>South Carolina</td>
<td>$30,564</td>
</tr>
<tr>
<td>Ohio</td>
<td>$30,239</td>
</tr>
</tbody>
</table>

### LOW-DEBT STATES

<table>
<thead>
<tr>
<th>State</th>
<th>Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utah</td>
<td>$18,873</td>
</tr>
<tr>
<td>New Mexico</td>
<td>$20,193</td>
</tr>
<tr>
<td>California</td>
<td>$22,191</td>
</tr>
<tr>
<td>Wyoming</td>
<td>$22,683</td>
</tr>
<tr>
<td>Florida</td>
<td>$23,379</td>
</tr>
<tr>
<td>Hawaii</td>
<td>$23,456</td>
</tr>
<tr>
<td>Nevada</td>
<td>$23,462</td>
</tr>
<tr>
<td>Arizona</td>
<td>$23,780</td>
</tr>
<tr>
<td>Washington</td>
<td>$24,600</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>$24,849</td>
</tr>
</tbody>
</table>

Source: Forbes
CONSUMER DEBT BY CATEGORY
US Consumers Aged 25-34

The number of US consumers aged 25-34 with student loan debt of at least $50,000 doubled from 2005 to 2015. During that same time, the average student loan debt across all age 25-34 consumers also doubled — by comparison, average credit card debt and mortgage debt for this population actually fell.

Source: FICO research
Current Complexion of the Fed
THE FED’S TOOLBOX

- Fractional Reserve Requirement
- Set Federal Funds Rate
- T-Bills

Macroprudential

FFR Under the Corridor System

Interest on Reserves

Reverse Repurchase Rate
FED FUNDS RATE UNDER THE CORRIDOR SYSTEM

Interest on Reserves

0 bp  50 bp  100 bp

Reverse Repo Rate
FUN FED FACTS

Yellen has been known to take an entire suitcase of books on vacation.
FUN FED FACTS

Yellen has a stamp collection estimated to be worth up to $50,000
FUN FED FACTS

Paul Volcker    Alan Greenspan    Ben Bernanke    Janet Yellen
# FUN FED FACTS

**Who Makes up the “Fed”?**

<table>
<thead>
<tr>
<th>Federal Reserve Board of Governors</th>
<th>Term End (Chair and Vice Chair)</th>
<th>End of Term as Governor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janet Yellen (Chair)</td>
<td>February 2018</td>
<td>2024</td>
</tr>
<tr>
<td>Stanley Fischer (Vice Chair)</td>
<td>June 2018</td>
<td>2020</td>
</tr>
<tr>
<td>Daniel Tarullo</td>
<td>Retiring April 2017</td>
<td>2022</td>
</tr>
<tr>
<td>Lael Brainard</td>
<td></td>
<td>2026</td>
</tr>
<tr>
<td>Jerome Powell</td>
<td></td>
<td>2028</td>
</tr>
<tr>
<td>Vacant</td>
<td></td>
<td>2018</td>
</tr>
<tr>
<td>Vacant</td>
<td></td>
<td>2030</td>
</tr>
</tbody>
</table>

**FOMC District Bank Voters in 2017**

<table>
<thead>
<tr>
<th>District Bank Voters in 2017</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>William Dudley</td>
<td>New York</td>
</tr>
<tr>
<td>Patrick Harker</td>
<td>Philadelphia</td>
</tr>
<tr>
<td>Charles Evans</td>
<td>Chicago</td>
</tr>
<tr>
<td>Neel Kashkari</td>
<td>Minneapolis</td>
</tr>
<tr>
<td>Robert Kaplan</td>
<td>Dallas</td>
</tr>
</tbody>
</table>
VOTER RELIABILITY

Source: Bloomberg
FED BALANCE SHEET

Source: Board of Governors of the Federal Reserve System (US)
FED BALANCE SHEET
Maturity Distribution of U.S. Treasuries

Source: Federal Reserve Bank of New York: System Open Market Account Holdings
FED CHOICES

![Graph showing balance sheet, balance sheet with baseline run off (Yellen's 2011 speech), and balance sheet without QE over time.]
BUT WHAT ABOUT DEBT AND DEFICITS?

Source: Congressional Budget Office, 2015.
CENTRAL BANK ASSETS
Normalized as of 1/02/2004

Source: Bloomberg
GLOBAL BOND MARKET

Source: JPMorgan Guide to the Markets
## GLOBAL BOND YIELDS

As of 8/31/17

<table>
<thead>
<tr>
<th></th>
<th>1Y</th>
<th>2Y</th>
<th>3Y</th>
<th>4Y</th>
<th>5Y</th>
<th>6Y</th>
<th>7Y</th>
<th>8Y</th>
<th>9Y</th>
<th>10Y</th>
<th>30Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>-0.84%</td>
<td>-0.80%</td>
<td>-0.73%</td>
<td>-0.63%</td>
<td>-0.54%</td>
<td>-0.36%</td>
<td>-0.28%</td>
<td>-0.20%</td>
<td>-0.13%</td>
<td>0.31%</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>-0.78%</td>
<td>-0.59%</td>
<td>-0.40%</td>
<td>-0.19%</td>
<td>-0.01%</td>
<td>0.34%</td>
<td>0.48%</td>
<td>0.61%</td>
<td>0.73%</td>
<td>1.70%</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>-0.79%</td>
<td>-0.74%</td>
<td>-0.64%</td>
<td>-0.52%</td>
<td>-0.37%</td>
<td>-0.07%</td>
<td>0.08%</td>
<td>0.22%</td>
<td>0.35%</td>
<td>1.19%</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>-0.71%</td>
<td>-0.65%</td>
<td>-0.55%</td>
<td>-0.43%</td>
<td>-0.28%</td>
<td>0.03%</td>
<td>0.18%</td>
<td>0.33%</td>
<td>0.45%</td>
<td>1.18%</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>-0.73%</td>
<td>-0.63%</td>
<td>-0.50%</td>
<td>-0.36%</td>
<td>-0.20%</td>
<td>0.12%</td>
<td>0.27%</td>
<td>0.41%</td>
<td>0.54%</td>
<td>1.34%</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>-0.63%</td>
<td>-0.57%</td>
<td>-0.47%</td>
<td>-0.33%</td>
<td>-0.18%</td>
<td>-0.15%</td>
<td>0.32%</td>
<td>0.48%</td>
<td>0.63%</td>
<td>1.71%</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>-0.66%</td>
<td>-0.60%</td>
<td>-0.49%</td>
<td>-0.35%</td>
<td>-0.19%</td>
<td>0.14%</td>
<td>0.31%</td>
<td>0.46%</td>
<td>0.60%</td>
<td>1.70%</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>-0.66%</td>
<td>-0.58%</td>
<td>-0.47%</td>
<td>-0.33%</td>
<td>-0.18%</td>
<td>0.13%</td>
<td>0.28%</td>
<td>0.42%</td>
<td>0.55%</td>
<td>1.50%</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>-0.67%</td>
<td>-0.65%</td>
<td>-0.48%</td>
<td>-0.40%</td>
<td>-0.27%</td>
<td>-0.01%</td>
<td>0.14%</td>
<td>0.31%</td>
<td>0.46%</td>
<td>1.05%</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>-0.16%</td>
<td>-0.17%</td>
<td>-0.16%</td>
<td>-0.14%</td>
<td>-0.14%</td>
<td>-0.12%</td>
<td>-0.09%</td>
<td>-0.07%</td>
<td>-0.03%</td>
<td>0.01%</td>
<td>0.82%</td>
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<tr>
<td>Spain</td>
<td>-0.46%</td>
<td>-0.30%</td>
<td>-0.11%</td>
<td>0.12%</td>
<td>0.37%</td>
<td>0.86%</td>
<td>1.10%</td>
<td>1.32%</td>
<td>1.51%</td>
<td>2.83%</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>-0.33%</td>
<td>-0.06%</td>
<td>0.24%</td>
<td>0.55%</td>
<td>0.86%</td>
<td>-1.44%</td>
<td>1.69%</td>
<td>1.91%</td>
<td>2.09%</td>
<td>3.24%</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>-0.36%</td>
<td>-0.02%</td>
<td>0.38%</td>
<td>0.80%</td>
<td>1.23%</td>
<td>-2.02%</td>
<td>2.36%</td>
<td>2.65%</td>
<td>2.89%</td>
<td>3.85%</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>0.14%</td>
<td>0.17%</td>
<td>0.20%</td>
<td>0.25%</td>
<td>0.44%</td>
<td>0.59%</td>
<td>0.68%</td>
<td>0.79%</td>
<td>0.93%</td>
<td>1.03%</td>
<td>1.70%</td>
</tr>
<tr>
<td>Canada</td>
<td>1.12%</td>
<td>1.25%</td>
<td>1.37%</td>
<td>1.47%</td>
<td>1.54%</td>
<td>1.69%</td>
<td>1.75%</td>
<td>1.83%</td>
<td>1.88%</td>
<td>2.25%</td>
<td></td>
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<tr>
<td>US</td>
<td>1.22%</td>
<td>1.33%</td>
<td>1.43%</td>
<td>-</td>
<td>1.70%</td>
<td>-1.94%</td>
<td>-</td>
<td>-</td>
<td>2.12%</td>
<td>2.73%</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>1.66%</td>
<td>1.89%</td>
<td>2.05%</td>
<td>2.18%</td>
<td>2.24%</td>
<td>2.33%</td>
<td>2.46%</td>
<td>2.55%</td>
<td>2.62%</td>
<td>2.71%</td>
<td>3.54%</td>
</tr>
</tbody>
</table>

Source: Bloomberg
CENTRAL BANKS AFFECT FLOWS TO U.S.

Source: JPMorgan Guide to the Markets
What’s Next?
OUR CAMPAIGNS HAVE NEVER BEEN FILLED WITH SUCH VITRIOL, RIGHT?

IF YOU ELECT THOMAS JEFFERSON

MURDER, ROBBERY, RAPE, INCEST, and ADULTERY will be practiced throughout the land.

Are you prepared to see your dwellings in flames... FEMALE CHASTITY VIOLATED, or children writhing on the pike?

JOHN ADAMS IS...

...just IMPORTING MISTRESSES from Europe or trying to marry one of his sons to a daughter of King George.

...a HIDEOUS, HERMaphroditical CHARACTER with neither the force or firmness of a man, nor the gentleness and sensibility of a woman.

John Adams

Thomas Jefferson
TRUMP & YELLEN

You’re Fired!
POSSIBLE ADDITIONS

• Ron Paul – former Texas Representative

• John Taylor – the “Oz” behind the Taylor Rule

• John Allison IV – Cato Institute and former CEO of BB&T

• Paul Atkins – former SEC member

• Tom Hoenig – VC of FDIC, and former head of Kansas City Fed
TRUMP AGENDA

• Affordable Care Act
• Infrastructure
  • Wants to spend $1 trillion over 10 years
• Tax Cuts
  • Corporate tax cuts: 35% down to 20%
  • Individual tax cuts from 40% down to 30%, all others to fall as well
  • Repatriation (could be as high as $2 trillion)
  • Fees on importers (border taxes)
• Dodd Frank
FED “DOT PLOT” VS MARKET EXPECTATIONS

Historical projections for December 31, 2017

The Median of the Federal Open Market Committee's Dots Data
The Overnight Index Swap Implied Interest Rate as of the FOMC Meeting Date

Source: Bloomberg
### FEDERAL RESERVES ECONOMIC PROJECTIONS

Federal Reserve Governors and Reserve Bank Presidents Forecasts

<table>
<thead>
<tr>
<th></th>
<th>2017 ESTIMATE</th>
<th>2018 ESTIMATE</th>
<th>2019 ESTIMATE</th>
<th>LONGER RUN</th>
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<tbody>
<tr>
<td><strong>REAL GDP RANGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 15, 2017</td>
<td>1.7% to 2.3%</td>
<td>1.7% to 2.4%</td>
<td>1.5% to 2.2%</td>
<td>1.6% to 2.2%</td>
</tr>
<tr>
<td>Dec. 14, 2016</td>
<td>1.7% to 2.4%</td>
<td>1.7% to 2.3%</td>
<td>1.5% to 2.2%</td>
<td>1.6% to 2.2%</td>
</tr>
</tbody>
</table>

| **UNEMPLOYMENT RATE RANGE** | | | | |
| March 15, 2017 | 4.4% to 4.7% | 4.2% to 4.7% | 4.1% to 4.8% | 4.5% to 5.0% |
| Dec. 14, 2016 | 4.4% to 4.7% | 4.2% to 4.7% | 4.1% to 4.8% | 4.5% to 5.0% |

| **PCE PRICE INDEX RANGE** | | | | |
| March 15, 2017 | 1.7% to 2.1% | 1.8% to 2.1% | 1.8% to 2.2% | 2.00% |
| Dec. 14, 2016 | 1.7% to 2.0% | 1.8% to 2.2% | 1.8% to 2.2% | 2.00% |

| **FEDERAL FUNDS RANGE** | | | | |
| March 15, 2017 | 0.9% to 2.1% | 0.9% to 3.4% | 0.9% to 3.9% | 2.5% to 3.8% |
| Dec. 14, 2016 | 0.9% to 2.1% | 0.9% to 3.4% | 0.9% to 3.9% | 2.5% to 3.8% |

Source: Federal Reserve Board
INTEREST RATE OUTLOOK
US Overnight Interest Rate Swaps

Source: Bloomberg
THANK YOU

Meeder Investment Management

Jason Headings
Direct: 614-760-2111
jheadings@meederinvestment.com